

WHAT IS CLAIMED IS:

1 1. A field emission display, comprising:

2 first and second substrates provided opposing one another with a predetermined gap

3 therebetween to form a vacuum assembly;

4 electron emission sources provided on one of the first and second substrates;

5 an electron emission inducing assembly inducing the emission of electrons from the electron

6 emission sources; and

7 an illuminating assembly provided on the other one of the first and second substrates not

8 including the electron emission sources being formed, the illuminating assembly realizing images

9 by the emission of electrons from the electron emission sources,

10 with the electron emission sources including a carbon nanotube layer and a base layer, the

11 base layer connecting the carbon nanotube layer to the one of the first and second substrates on

12 which the electron emission sources are provided and having conductivity for applying a voltage

13 to the carbon nanotube layer required for the emission of electrons, and

14 with the base layer having a predetermined thickness, and the carbon nanotube layer being

15 provided on the base layer in a state substantially un-mixed with the base layer.

1 2. The field emission display of claim 1, wherein the electron emission inducing assembly

2 comprises:

3 cathode electrodes formed in a stripe pattern on one of the first and second substrates having

4 the electron emission sources provided, the electron emission sources being provided on an outer
5 surface of the cathode electrodes;
6 an insulating layer formed covering the cathode electrodes at all areas except where the
7 electron emission sources are formed; and
8 gate electrodes formed on the insulating layer in a stripe pattern and in a direction
9 substantially perpendicular to the cathode electrodes, the gate electrodes including holes for exposing
10 the electron emission sources.

1 3. The field emission display of claim 1, wherein the electron emission inducing assembly
2 comprises:

3 gate electrodes formed in a stripe pattern on one of the first and second substrates provided
4 with the electron emission sources;

5 an insulating layer formed over an entire surface of one of the first and second substrates
6 provided with the electron emission sources and covering the gate electrodes; and

7 cathode electrodes formed on the insulating layer in a stripe pattern and in a direction
8 substantially perpendicular to the gate electrodes, the electron emission sources being formed on an
9 outer surface of the cathode electrodes.

1 4. The field emission display of claim 1, wherein the illuminating assembly comprises:

2 an anode electrode formed on the substrate on which the electron emission sources are not
3 formed; and

4 phosphor layers formed on an outer surface of the anode electrode.

1 5. The field emission display of claim 1, wherein the base layer includes an adhesive material
2 having conductivity selected from the group consisting of silver, nickel, aluminum, gold, cobalt,
3 and iron.

1 6. The field emission display of claim 1, wherein the base layer includes a metal conductive
2 material selected from the group consisting of silver, copper, and aluminum.

1 7. The field emission display of claim 1, wherein the base layer comprises:
2 an adhesive material realized through a glass frit that selected from the group consisting of
3 PbO, SiO₂, Ba₂O₃, and a mixture thereof; and
4 a metal conductive material selected from the group consisting of silver, copper, and
5 aluminum.

1 8. The field emission display of claim 1, wherein the base layer has an outer surface that
2 includes prominences and depressions.

1 9. The field emission display of claim 8, wherein the base layer includes spherical particles
2 with a diameter of 0.05 to 5μm.

1 10. The field emission display of claim 9, wherein the spherical particles are conductive
2 metal particles selected from the group consisting of silver, copper, and aluminum.

1 11. The field emission display of claim 8, wherein the base layer includes a thin film having
2 prominences and depressions at 0.05 to 10 μm width, 0.01 to 5 μm depth and 1 to 20 μm intervals.

1 12. The field emission display of claim 11, wherein the thin film is formed of indium tin
2 oxide or chrome.

1 13. The field emission display of claim 1, wherein a carbon nanotube density of the carbon
2 nanotube layer is 100 to 1,000,000 times a carbon nanotube density of the base layer.

1 14. The field emission display of claim 1, wherein the base layer is formed at a thickness of
2 0.05 μm to 5 μm .

1 15. A field emission display, comprising:
2 first and second substrates provided opposing one another with a predetermined gap
3 therebetween to form a vacuum assembly;
4 electron emission sources provided on one of the first and second substrates;
5 an electron emission inducing assembly for inducing the emission of electrons from the
6 electron emission sources; and

7 an illuminating assembly provided on one of the first and second substrates on which the
8 electron emission sources are not formed, the illuminating assembly realizing images by the emission
9 of electrons from the electron emission sources,

10 with the electron emission sources comprising a carbon nanotube layer and a base layer, the
11 base layer connecting the carbon nanotube layer to the substrate on which the electron emission
12 sources are provided and having conductivity for applying a voltage to the carbon nanotube layer
13 required for the emission of electrons,

14 with the base layer having a predetermined thickness, and the carbon nanotube layer being
15 provided on the base layer in a state substantially un-mixed with the base layer, and

16 with the base layer having an outer surface that includes prominences and depressions by
17 spherical particles with a diameter in the range of 0.05 to 5 μ m.

1 16. A field emission display, comprising:

2 first and second substrates provided opposing one another with a predetermined gap
3 therebetween to form a vacuum assembly;

4 electron emission sources provided on one of the first and second substrates;

5 an electron emission inducing assembly for inducing the emission of electrons from the
6 electron emission sources; and

7 an illuminating assembly provided on the other one of the first and second substrates on
8 which the electron emission sources are not formed, the illuminating assembly realizing images by
9 the emission of electrons from the electron emission sources,

10 with the electron emission sources including a carbon nanotube layer and a base layer, the
11 base layer connecting the carbon nanotube layer to the substrate on which the electron emission
12 sources are provided and including conductivity accommodating an applying of a voltage to the
13 carbon nanotube layer required for the emission of electrons,

14 with the base layer including a predetermined thickness, and the carbon nanotube layer being
15 provided on the base layer in a state substantially un-mixed with the base layer, and

16 with the base layer including an outer surface that includes prominences and depressions by
17 a thin film layer having prominences and depressions at an interval of 1 to 20 μm and a depth of 0.01
18 to 5 μm .

1 17. A field emission display, comprising:

2 first and second substrates provided opposing one another with a predetermined gap
3 therebetween to form a vacuum assembly;

4 electron emission sources provided on one of the first and second substrates;

5 an electron emission inducing assembly for inducing the emission of electrons from the
6 electron emission sources; and

7 an illuminating assembly provided on the other one of the first and second substrates not
8 having the electron emission sources formed, the illuminating assembly realizing images by the
9 emission of electrons from the electron emission sources,

10 with the electron emission sources including a carbon nanotube layer and a base layer, the
11 base layer connecting the carbon nanotube layer to the one of the first and second substrates on

12 which the electron emission sources are provided and having conductivity for applying a voltage
13 to the carbon nanotube layer required for the emission of electrons,
14 with the base layer having a predetermined thickness, and the carbon nanotube layer being
15 provided on the base layer in a state substantially un-mixed with the base layer, and
16 with a carbon nanotube density of the carbon nanotube layer is in the range of 100 to
17 1,000,000 times a carbon nanotube density of the base layer.

1 18. A method for forming electron emission sources for a field emission display, comprising:
2 screen printing a first mixture including an adhesive material, a conductive material, and a .
3 vehicle on a substrate and then drying the first mixture;
4 screen printing a second mixture including carbon nanotube powder and a vehicle on the first
5 mixture and then drying the second mixture; and
6 baking the first and second mixtures to fuse the adhesive material of the first mixture, and
7 to evaporate organic elements in the first and second mixtures.

1 19. The method of claim 18, with the adhesive material having conductivity selected from
2 the group consisting of silver, nickel, aluminum, gold, cobalt, and iron.

1 20. The method of claim 18, wherein with the metal conductive material selected from the
2 group consisting of silver, copper, and aluminum.

1 21. The method of claim 18, wherein:

2 the adhesive material is realized through a glass frit selected from the group consisting of

3 PbO, SiO₂, Ba₂O₃, and a mixture thereof; and

4 the metal conductive material is selected from the group consisting essentially of silver,

5 copper, and aluminum.

1 22. The method of claim 18, further comprising of:

2 coating a conductive film on cathode electrodes;

3 coating a photoregister on the conductive film at a thickness in the range of 1 to 5 μm;

4 patterning a photoresist at 1 to 20 μm intervals to accommodate the exposure of the

5 conductive film; and

6 etching portions of the conductive film by an etching solution to expose portions of the

7 conductive film to accommodate the formation of protrusions and depressions at intervals of 1 to

8 20μm, a depth of 0.01 to 5μm and a width of 0.05 to 10μm.

1 23. A method for forming electron emission sources for a field emission display, comprising:

2 screen printing a first mixture including an adhesive material, a conductive material, a

3 photosensitive resin, a photoinitiator, and a vehicle on a substrate and then drying the first mixture;

4 screen printing a second mixture including carbon nanotube powder, a photosensitive resin,

5 a photoinitiator, and a vehicle on the first mixture and then drying the second mixture;

6 developing portions of the first and second mixtures to selectively harden the first and second

7 mixtures;

8 patterning the first and second mixtures by removing area not hardened through the
9 developing process; and

10 baking remaining areas of the first and second mixtures to fuse the adhesive material of the
11 first mixture, and to evaporate organic elements in the first and second mixtures.

1 24. A field emission display, comprising:

2 electron emission sources provided on a first substrate, the electron emission sources
3 comprising a carbon nanotube layer and a base layer, the base layer connecting the carbon nanotube
4 layer to the first substrate and including conductivity accommodating an applying of a voltage to
5 the carbon nanotube layer required for the emission of electrons, the base layer including a
6 predetermined thickness, and the carbon nanotube layer being provided on the base layer in a state
7 substantially un-mixed with the base layer.

1 25. The field emission display of claim 24, further comprising of a second substrate provided
2 opposing the first substrate with a predetermined gap therebetween to form a vacuum assembly.

1 26. The field emission display of claim 24, further comprising of an electron emission
2 inducing assembly inducing the emission of electrons from the electron emission sources.

3 27. The field emission display of claim 25, further comprising of an illuminating assembly

4 provided on the second substrate, the second substrate not including the electron emission sources
5 being formed, the illuminating assembly realizing images by the emission of electrons from the
6 electron emission sources,

1 28. The field emission display of claim 24, wherein the base layer includes an adhesive
2 material having conductivity selected from the group consisting of silver, nickel, aluminum, gold,
3 cobalt, and iron.

1 29. The field emission display of claim 24, wherein the base layer includes a metal
2 conductive material selected from the group consisting of silver, copper, and aluminum.

1 30. The field emission display of claim 24, wherein the base layer comprises:
2 an adhesive material realized through a glass frit that selected from the group consisting of
3 PbO , SiO_2 , Ba_2O_3 , and a mixture thereof; and
4 a metal conductive material selected from the group consisting of silver, copper, and
5 aluminum.

1 31. The field emission display of claim 24, wherein the base layer has an outer surface that
2 includes prominences and depressions.

1 32. The field emission display of claim 24, wherein the base layer includes spherical particles

1 with a diameter of 0.05 to 5 μm .

1 33. The field emission display of claim 24, wherein the spherical particles are conductive
2 metal particles selected from the group consisting of silver, copper, and aluminum.

1 34. The field emission display of claim 24, wherein the base layer includes a thin film having
2 prominences and depressions at an interval of 1 to 20 μm , a depth of 0.01 to 5 μm and a width of 0.05
3 to 10 μm .

1 35. The field emission display of claim 34, wherein the thin film is formed of indium tin
2 oxide or chrome.

1 36. The field emission display of claim 24, wherein a carbon nanotube density of the carbon
2 nanotube layer is 100 to 1,000,000 times a carbon nanotube density of the base layer.

1 37. The field emission display of claim 24, wherein the base layer is formed at a thickness
2 of 0.05 μm to 5 μm .

1 38. The field emission display of claim 24, wherein the base layer includes spherical particles
2 with a diameter of 0.05 to 5 μm creating prominences and depressions on outer surface of the base
3 layer.